

CLAIMS:

Sub A1 1. A method of orientating a space curve, wherein the space curve has two endpoints, the method comprising the steps of:

- 5 (i) selecting a desired direction;
- (ii) generating a first vector having a direction which is same as the selected desired direction;
- (iii) generating at least one second vector, each said second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;
- 10 (iv) comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and
- (v) orientating said direction of said space curve in accordance with said
- 15 determined direction.

2. A method as claimed in claim 1, wherein said step (iii) comprises the substeps of:

- (iii)(a) determining said endpoints of said space curve; and
- 20 (iii)(b) generating one said second vector connecting both said endpoints.

3. A method as claimed in claim 1, wherein said step (iii) comprises the substeps of:

- (iii)(a) determining said endpoints of said space curve; and
- 25 (iii)(b) generating two said second vectors, each connecting both said endpoints and having opposite directions.

4. A method as claimed in claim 3, wherein said comparing step (iv) comprises the sub-steps of;

- 30 (iv)(a) determining a first angle between one of said second vectors and said first vector;
- (iv)(b) determining a second angle between the other one of said second vectors and said first vector;

(iv)(c) comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

5           5.       A method as claimed in claim 2, wherein said comparing step (iv) comprises the sub-steps of:

              (iv)(a) determining a first angle between said first vector and said second vector;

10           (iv)(b) comparing said first angle with a first threshold value; wherein if said first angle is less than said first threshold value then the determined direction of the space curve is in a first direction, and if said first angle is greater than said first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

15           6.       A method as claimed in claim 5, wherein said first threshold value is 90°.

              7.       A method as claimed in claim 4, wherein said method further comprises the step of generating a vector orthogonal to said first vector.

20           8.       A method as claimed in claim 5, wherein said method further comprises the step of generating a vector orthogonal to said first vector.

              9.       A method as claimed in claim 7 or 8, wherein said orthogonal vector is generated in a predetermined manner.

25           10.       A method as claimed in claim 7 or 8, wherein said orthogonal vector is generated in accordance with a user selected direction.

30           11.       A method as claimed in claim 7, wherein, if said first angle equals said second angle, the comparing step (iv) further comprises the sub-steps of:

              (iv)(d) determining a third angle between one of said second vectors and said orthogonal vector;

(iv)(e) determining a fourth angle between the other one of said second vectors and said orthogonal vector;

(iv)(f) comparing said third angle with said fourth angle, wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

12. A method as claimed in claim 8, wherein, if said first angle equals said first threshold value, the comparing step (iv) further comprises the sub-steps of:

(iv)(c) determining a second angle between said second vector and said orthogonal vector;

(iv)(d) comparing said second angle with a second threshold value; wherein if said second angle is less than said second threshold value then the determined direction of the space curve is in a third direction, and if said second angle is greater than said second threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

13. A method as claimed in claim 12, wherein said second threshold value is 90°.

14. A method as claimed in claim 1, wherein said step (iii) comprises the substeps of:

(iii)(a) determining endpoints of said curve; and

(iii)(b) generating, at each said endpoint, a said second vector tangent to said curve.

15. A method as claimed in claim 14, wherein said comparing step (iv) comprises the sub-steps of;

(iv)(a) determining a first angle between one of said second vectors and said first vector;

(iv)(b) determining a second angle between the other one of said second vectors and said first vector;

(iv)(c) comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

16. A method as claimed in claim 15, wherein said step (iii) further comprises the substeps of:

(iii)(c) generating one said third vector connecting both said endpoints.

17. A method as claimed in claim 15, wherein said step (iii) further comprises the substeps of:

(iii)(c) generating two said third vectors, each connecting both said endpoints and having opposite directions.

18. A method as claimed in claim 17, wherein said comparing step (iv) further comprises the sub-steps of;

(iv)(d) determining a third angle between one of said third vectors and said first vector;

(iv)(e) determining a fourth angle between the other one of said third vectors and said first vector;

(iv)(f) comparing said third angle with said fourth angle; wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

19. A method as claimed in claim 16, wherein said comparing step (iv) comprises the sub-steps of:

(iv)(d) determining a third angle between said third vector and said first vector;

(iv)(e) comparing said third angle with a first threshold value; wherein if said third angle is less than said first threshold value then the determined direction of the space curve is in a third direction, and if said third angle is greater than said first threshold value

then the determined direction of the space curve is in a fourth direction, opposite the third direction.

20. A method as claimed in claim 19, wherein said first threshold value is  
5 90°.

21. A method as claimed in claim 18, wherein said step (iii) comprises the substep  
of:

(iii)(a) generating a vector orthogonal to said first vector.

22. A method as claimed in claim 19, wherein said step (iii) comprises the substep  
of:

(iii)(a) generating a vector orthogonal to said first vector.

23. A method as claimed in claim 21 or 22, wherein said orthogonal vector is  
generated in a predetermined manner.

24. A method as claimed in claim 21 or 22, wherein said orthogonal vector is  
generated in accordance with a user selected direction.

25. A method as claimed in claim 21, wherein, if said third angle equals said fourth  
angle, the comparing step further comprises the following sub-steps:

(iv)(g) determining a fifth angle between said first one of said third vectors and  
said orthogonal vector;

(iv)(h) determining a sixth angle between said other one of said third vectors  
and said orthogonal vector;

(iv)(i) comparing said fifth angle with said sixth angle, wherein if said fifth  
angle is less than said sixth angle then the determined direction of the space curve is in a  
fifth direction, and if said fifth angle is greater than said sixth angle then the determined  
direction of the space curve is in a sixth direction, opposite the fifth direction.

26. A method as claimed in claim 22, wherein, if said third angle equals said first  
threshold value, the comparing step (iv) comprises the following sub-steps:

(iv)(f) determining a fourth angle between said third vector and said orthogonal vector;

(iv)(g) comparing said fourth angle with a second threshold value; wherein if said fourth angle is less than said second threshold value then the determined direction of the space curve is in a fourth direction, and if said fourth angle is greater than said second threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

27. A method as claimed in claim 26, wherein said second threshold value is 90°.

28. A method as claimed in claim 1, wherein the method comprises the step of providing further space curves and performing the steps (iii) to (v) on each space curve.

29. A method as claimed in claim 1, wherein the method comprises a plurality of techniques for generating the second vectors and a step for selecting one of said techniques in response to user input.

30. A method of orientating a finite n-dimensional space curve, wherein the space curve has two endpoints, the method comprising the steps of:

(i) selecting a desired direction in response to user input;

(ii) generating a first vector having a direction which is same as the selected desired direction;

(iii) generating at least one second vector based upon the finite n-dimensional space curve;

(iv) comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and

(v) orientating said finite n-dimensional space curve to the determined direction.

31. A method of orientating a character stroke, the method comprising the steps of:

(i) selecting a desired direction for orientating the character stroke;  
(ii) generating a first vector having a direction which is same as the selected desired direction;

5 (iii) generating a space curve representative of the character stroke, wherein the space curve has two endpoints;

(iv) generating two second vectors, each connecting both said endpoints and having opposite directions;

10 (v) comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and wherein said comparing step comprises the sub-steps of:

(v)(a) determining a first angle between one of said two second vectors and said first vector;

15 (v)(b) determining a second angle between the other one of said two second vectors and said first vector; and

(v)(c) comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction;

20 (vi) orientating said direction of said space curve in accordance with said determined direction; and

(vii) orientating the character stroke in accordance with the direction of the space curve.

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32. Apparatus for orientating a space curve, wherein the space curve has two endpoints, the apparatus comprising:

selection means for selecting a desired direction;

30 first generation means for generating a first vector having a direction which is same as the selected desired direction;

means for providing a space curve;

second generation means for generating at least one second vector, each said second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;

5 comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and

orientation means for orientating said direction of said space curve in accordance with said determined direction.

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33. Apparatus claimed in claim 32, wherein said second generation means comprises:

means for determining said endpoints of said space curve; and

means for generating one said second vector connecting both said endpoints.

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34. Apparatus as claimed in claim 32, wherein said second generating means comprises:

means for determining said endpoints of said space curve; and

20 means for generating two said second vectors, each connecting both said endpoints and having opposite directions.

35. Apparatus as claimed in claim 34, wherein said first comparison means comprises:

25 means for determining a first angle between one of said second vectors and said first vector;

means for determining a second angle between the other one of said second vectors and said first vector;

30 means for comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction.



36. Apparatus as claimed in claim 33, wherein said first comparison means comprises:

means for determining a first angle between said first vector and said second vector;

5 means for comparing said first angle with a first threshold value; wherein if said first angle is less than said first threshold value then the determined direction of the space curve is in a first direction, and if said first angle is greater than said first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

10 37. Apparatus as claimed in claim 36, wherein said first threshold value is  $90^\circ$ .

38. Apparatus as claimed in claim 35, wherein said apparatus further comprises means for generating a vector orthogonal to said first vector.

15 39. Apparatus as claimed in claim 36, wherein said apparatus further comprises means for generating a vector orthogonal to said first vector.

20 40. Apparatus as claimed in claim 38 or 39, wherein said orthogonal vector is generated in a predetermined manner.

41. Apparatus as claimed in claim 38 or 39, wherein said orthogonal vector is generated in accordance with a user selected direction.

25 42. Apparatus as claimed in claim 38, wherein the first comparison means further comprises:

means for determining a third angle between one of said second vectors and said orthogonal vector;

30 means for determining a fourth angle between the other one of said second vectors and said orthogonal vector;

means for comparing said third angle with said fourth angle, wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a

third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

43. Apparatus as claimed in claim 39, wherein the first comparison means further  
5 comprises:

means for determining a second angle between said second vector and said  
orthogonal vector;

means for comparing said second angle with a second threshold value; wherein if  
said second angle is less than said second threshold value then the determined direction of  
10 the space curve is in a third direction, and if said second angle is greater than said second  
threshold value then the determined direction of the space curve is in a fourth direction,  
opposite the third direction.

44. Apparatus as claimed in claim 43, wherein said second threshold value is  
15 90°.

45. Apparatus as claimed in claim 32, wherein said second generation means  
comprises:

means for determining endpoints of said curve; and  
20 means for generating, at each said endpoint, a said second vector tangent to said  
curve.

46. Apparatus as claimed in claim 45, wherein said first comparison means  
comprises

25 means for determining a first angle between one of said second vectors and said  
first vector;

means for determining a second angle between the other one of said second  
vectors and said first vector;

means for comparing said first angle with said second angle; wherein if said first  
30 angle is less than said second angle then the determined direction of the space curve is in  
a first direction, and if said first angle is greater than said second angle then the  
determined direction of the space curve is in a second direction, opposite the first  
direction.

47. Apparatus as claimed in claim 46, wherein said second generation means comprises:

means for generating one said third vector connecting both said endpoints.

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48. Apparatus as claimed in claim 46, wherein said second generation means further comprises:

means for generating two said third vectors, each connecting both said endpoints and having opposite directions.

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49. Apparatus as claimed in claim 48, wherein said first comparison means further comprises:

means for determining a third angle between one of said third vectors and said first vector;

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means for determining a fourth angle between the other one of said third vectors and said first vector;

means for comparing said third angle with said fourth angle; wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

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50. Apparatus as claimed in claim 47, wherein said first comparison means comprises:

means for determining a third angle between said third vector and said first vector;

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means for comparing said third angle with a first threshold value; wherein if said third angle is less than said first threshold value then the determined direction of the space curve is in a third direction, and if said third angle is greater than said first threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

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51. Apparatus as claimed in claim 50, wherein said first threshold value is 90°.

52. Apparatus as claimed in claim 49, wherein said second generation means comprises:

means for generating a vector orthogonal to said first vector.

5 53. Apparatus as claimed in claim 50, wherein said second generation means comprises:

means for generating a vector orthogonal to said first vector.

10 54. Apparatus as claimed in claim 52 or 53, wherein said orthogonal vector is generated in a predetermined manner.

55. Apparatus as claimed in claim 52 or 53, wherein said orthogonal vector is generated in accordance with a user selected direction.

15 56. Apparatus as claimed in claim 52, wherein the first comparison means further comprises:

means for determining a fifth angle between said first one of said third vectors and said orthogonal vector;

20 means for determining a sixth angle between said other one of said third vectors and said orthogonal vector;

means for comparing said fifth angle with said sixth angle, wherein if said fifth angle is less than said sixth angle then the determined direction of the space curve is in a fifth direction, and if said fifth angle is greater than said sixth angle then the determined direction of the space curve is in a sixth direction, opposite the fifth direction.

25 57. Apparatus as claimed in claim 53, wherein the first comparison means further comprises the following:

means for determining a fourth angle between said third vector and said orthogonal vector;

30 means for comparing said fourth angle with a second threshold value; wherein if said fourth angle is less than said second threshold value then the determined direction of the space curve is in a fourth direction, and if said fourth angle is greater than said second

threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

58. Apparatus as claimed in claim 57, wherein said second threshold value is  
5 90°.

59. Apparatus as claimed in claim 32, wherein the apparatus comprises means for providing further space curves and performing the operations of the second generation means, first comparison means and orientation means on each space curve.  
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60. Apparatus as claimed in claim 32, wherein the apparatus comprises a plurality of techniques for generating the second vectors and means for selecting one of said techniques in response to user input.

61. Apparatus for orientating a finite n-dimensional space curve, wherein the space curve has two endpoints, the apparatus comprising:  
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means for selecting a desired direction in response to user input;

means for generating a first vector having a direction which is same as the selected desired direction;

20 means for providing a n-dimensional space curve;

means for generating at least one second vector based upon the finite n-dimensional space curve;

means for comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and  
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means for orientating said finite n-dimensional space curve to the determined direction.

62. Apparatus for orientating a character stroke, the apparatus comprising:  
30 means for selecting a desired direction for orientating the character stroke;  
means for generating a first vector having a direction which is same as the selected desired direction;

means for generating a space curve representative of the character stroke, wherein the space curve has two;

means for generating two second vectors, each connecting both said endpoints and having opposite directions;

5 means for comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and wherein said comparison means comprising:

10 means for determining a first angle between one of said two second vectors and said first vector;

means for determining a second angle between the other one of said two second vectors and said first vector; and

15 means for comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction;

means for orientating said direction of said space curve in accordance with said determined direction; and

20 means for orientating the character stroke in accordance with the direction of the space curve.

63. A computer program product comprising a computer readable medium having a computer program for orientating a space curve, wherein the space curve has two endpoints, the computer program product comprising:

selection means for selecting a desired direction;

first generation means for generating a first vector having a direction which is same as the selected desired direction;

means for providing a space curve;

30 second generation means for generating at least one second vector, each said second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;

first comparison means for comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and

5           orientation means for orientating said direction of said space curve in accordance with said determined direction.

64.       A computer program product claimed in claim 63, wherein said second generation means comprises:

10           means for determining said endpoints of said space curve; and

          means for generating one said second vector connecting both said endpoints.

65.       A computer program product as claimed in claim 63, wherein said second generating means comprises:

15           means for determining said endpoints of said space curve; and

          means for generating two said second vectors, each connecting both said endpoints and having opposite directions.

66.       A computer program product as claimed in claim 65, wherein said first comparison means comprises:

20           means for determining a first angle between one of said second vectors and said first vector;

          means for determining a second angle between the other one of said second vectors and said first vector;

25           means for comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

30       67.       A computer program product as claimed in claim 64, wherein said first comparison means comprises:

means for determining a first angle between said first vector and said second vector;

means for comparing said first angle with a first threshold value; wherein if said first angle is less than said first threshold value then the determined direction of the space curve is in a first direction, and if said first angle is greater than said first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

68. A computer program product as claimed in claim 67, wherein said first threshold value is 90°.

69. A computer program product as claimed in claim 66, wherein said computer program product further comprises means for generating a vector orthogonal to said first vector.

70. A computer program product as claimed in claim 67, wherein said computer program product further comprises means for generating a vector orthogonal to said first vector.

71. A computer program product as claimed in claim 69 or 70, wherein said orthogonal vector is generated in a predetermined manner.

72. A computer program product as claimed in claim 69 or 70, wherein said orthogonal vector is generated in accordance with a user selected direction.

73. A computer program product as claimed in claim 69, wherein the first comparison means further comprises:

means for determining a third angle between one of said second vectors and said orthogonal vector;

means for determining a fourth angle between the other one of said second vectors and said orthogonal vector;

means for comparing said third angle with said fourth angle, wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a



third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

74. A computer program product as claimed in claim 70, wherein the first  
5 comparison means further comprises:

means for determining a second angle between said second vector and said  
orthogonal vector;

means for comparing said second angle with a second threshold value; wherein if  
said second angle is less than said second threshold value then the determined direction of  
10 the space curve is in a third direction, and if said second angle is greater than said second  
threshold value then the determined direction of the space curve is in a fourth direction,  
opposite the third direction.

75. A computer program product as claimed in claim 74, wherein said second  
15 threshold value is 90°.

76. A computer program product as claimed in claim 63, wherein said second  
generation means comprises:

means for determining endpoints of said curve; and  
20 means for generating, at each said endpoint, a said second vector tangent to said  
curve.

77. A computer program product as claimed in claim 76, wherein said first  
comparison means comprises

25 means for determining a first angle between one of said second vectors and said  
first vector;

means for determining a second angle between the other one of said second  
vectors and said first vector;

means for comparing said first angle with said second angle; wherein if said first  
30 angle is less than said second angle then the determined direction of the space curve is in  
a first direction, and if said first angle is greater than said second angle then the  
determined direction of the space curve is in a second direction, opposite the first  
direction.

78. A computer program product as claimed in claim 77, wherein said second generation means comprises:

means for generating one said third vector connecting both said endpoints.

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79. A computer program product as claimed in claim 77, wherein said second generation means further comprises:

means for generating two said third vectors, each connecting both said endpoints and having opposite directions.

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80. A computer program product as claimed in claim 79, wherein said first comparison means further comprises:

means for determining a third angle between one of said third vectors and said first vector;

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means for determining a fourth angle between the other one of said third vectors and said first vector;

means for comparing said third angle with said fourth angle; wherein if said third angle is less than said fourth angle then the determined direction of the space curve is in a third direction, and if said third angle is greater than said fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

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81. A computer program product as claimed in claim 78, wherein said first comparison means comprises:

means for determining a third angle between said third vector and said first vector;

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means for comparing said third angle with a first threshold value; wherein if said third angle is less than said first threshold value then the determined direction of the space curve is in a third direction, and if said third angle is greater than said first threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

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82. A computer program product as claimed in claim 81, wherein said first threshold value is 90°.

83. A computer program product as claimed in claim 80, wherein said second generation means comprises:

means for generating a vector orthogonal to said first vector.

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84. A computer program product as claimed in claim 81, wherein said second generation means comprises:

means for generating a vector orthogonal to said first vector.

10 85. A computer program product as claimed in claim 83 or 84, wherein said orthogonal vector is generated in a predetermined manner.

86. A computer program product as claimed in claim 83 or 84, wherein said orthogonal vector is generated in accordance with a user selected direction.

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87. A computer program product as claimed in claim 83, wherein the first comparison means further comprises:

means for determining a fifth angle between said first one of said third vectors and said orthogonal vector;

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means for determining a sixth angle between said other one of said third vectors and said orthogonal vector;

means for comparing said fifth angle with said sixth angle, wherein if said fifth angle is less than said sixth angle then the determined direction of the space curve is in a fifth direction, and if said fifth angle is greater than said sixth angle then the determined direction of the space curve is in a sixth direction, opposite the fifth direction.

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88. A computer program product as claimed in claim 84, wherein the first comparison means further comprises:

means for determining a fourth angle between said third vector and said orthogonal vector;

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means for comparing said fourth angle with a second threshold value; wherein if said fourth angle is less than said second threshold value then the determined direction of the space curve is in a fourth direction, and if said fourth angle is greater than said second

threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

5 89. A computer program product as claimed in claim 88, wherein said second threshold value is 90°.

10 90. A computer program product as claimed in claim 63, wherein the computer program product comprises means for providing further space curves and performing the operations of the second generation means, first comparison means and orientation means on each space curve.

15 91. A computer program product as claimed in claim 63, wherein the computer program product comprises a plurality of techniques for generating the second vectors and means for selecting one of said techniques in response to user input.

20 92. A computer program product comprising a computer readable medium including a computer program for orientating a finite n-dimensional space curve, wherein the space curve has two endpoints, the computer program product comprising:

means for selecting a desired direction in response to user input;  
20 means for generating a first vector having a direction which is same as the selected desired direction,

means for providing a n-dimensional space curve;  
means for generating at least one second vector based upon the finite n-dimensional space curve;

25 means for comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and

30 means for orientating said finite n-dimensional space curve to the determined direction.

93. A computer program product comprising a computer readable medium including a computer program for orientating a character stroke, the computer program product comprising:

means for selecting a desired direction for orientating the character stroke;

5 means for generating a first vector having a direction which is same as the selected desired direction;

means for generating a space curve representative of the character stroke, wherein the space curve has two endpoints,

10 means for generating two second vectors, each connecting both said endpoints and having opposite directions;

means for comparing the first and second vectors so as to determine a direction of said space curve, wherein said determined direction of said space curve is along said curve from a first said endpoint to a second said endpoint and which is closest to said selected desired direction; and wherein said comparison means comprises:

15 means for determining a first angle between one of said two second vectors and said first vector;

means for determining a second angle between the other one of said two second vectors and said first vector; and

20 means for comparing said first angle with said second angle; wherein if said first angle is less than said second angle then the determined direction of the space curve is in a first direction, and if said first angle is greater than said second angle then the determined direction of the space curve is in a second direction, opposite the first direction;

25 means for orientating said direction of said space curve in accordance with said determined direction; and

means for orientating the character stroke in accordance with the direction of the space curve.